

JUNE 1979

No. 6



FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



noaa

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION

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**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE**

SOUTHWEST FISHERIES CENTER

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FISHING INFORMATION

JUNE 1979, No. 6



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**I. Barrett, Director, SOUTHWEST FISHERIES CENTER
J. Carr, Deputy Director**

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. It contains a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

To cancel delivery of this publication in the event you no longer need to receive it, or to change the delivery address if you are moving but still need to receive it, please notify us by writing: James A. Renner, Editor, Fishing Information, National Marine Fisheries Service, Southwest Fisheries Center, P.O. Box 271, La Jolla, California 92038.

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, and
15 day supplement)

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Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L. F. Giovando from observations by:

J. Redhead at Langara Island Light; D. Giger at Cape St. James Light;

L. Collins at Kains Island Light; M. V. Stewart at

Amphitrite Point Light

Scripps Institution of Oceanography, La Jolla, California

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Manuacavili* of the Matson Navigation Co. The data are processed under supervision of D. R. McLain at the NMFS Pacific Environmental Group, Monterey, California, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

During June the Aleutian low pressure center is normally located near 55°N, 175°W and the sub-tropical high pressure center is normally at 35°N, 143°W (Figure 1). Weather fronts and low pressure systems deepen in the central Pacific between 40°N and 50°N and move eastward, usually crossing the coast north of 45°N. Ocean mixing is normally greatest north of 40°N. Along the eastern boundary of the subtropical high pressure system, surface winds average greater than 15 knots and extensive southward transport of colder water from northern latitudes takes place in the California Current. Coastal upwelling and southward transport of cold water normally causes sea surface temperatures (SST) to be 3 to 5°C colder along the central California coast than offshore outside 100 miles. West of 130°W from 30°N to 45°N, seasonal warming normally results in a rapid northward advance of SST's between 20°C and 15°C. As SST's are increasing northward off the California and Oregon coasts, the albacore tuna usually enter the west coast fishery from the west. Extensive low cloudiness covers most of the west coast, especially over the cold coastal waters in June.

During June 1979 the Aleutian low center shifted west of its normal position to 55°N, 170°E. The westward displacement of the Aleutian low was common from January to April 1979. The subtropical high pressure center was displaced about 800 nautical miles northwest of its normal position, and central pressures were 4-6 millibars above normal. The subtropical high pressure system was the most dominant weather feature over the eastern Pacific. As a result, a high pressure ridge often extended eastward over southern British Columbia and the Oregon-Washington coast. Frequently, weather fronts followed northern tracks across the Gulf of Alaska around the high pressure system and into northern British Columbia. Strong northerly coastal winds south of Cape Blanco (43°N) were 3 to 5 knots above normal.

In June 1979 the SST pattern (Figure 3) was closer to normal over most of the eastern north Pacific east of 155°W than in any previous month since September 1977. The only west coast area with negative SST departures more than 1°C below normal was found along the U.S. west coast from 35°N to 40°N (Figure 5). In this coastal region and northward to British Columbia, surface winds were frequently very strong, and ocean wind mixing combined with coastal upwelling lowered SST's to less than 13°C. Coastal SST's north of 37°N were 1 to 2°C lower in June 1979 than in June 1978 (Figure 7). This was due primarily to the pronounced east-west elongation of the subtropical high pressure system which extended over the west coast north of 40°N. From 25°N to 37°N, west of 155°W, SST's were more than 1°C below normal as a result of easterly trade winds that were 3 to 5 knots above normal (Figure 2). Along the periphery of the high pressure system south of 40°N, SST's were more than 1°C lower in June than one year ago because of the above normal strength of the high pressure system. From 40°N to 50°N, SST's were above normal over most of the north Pacific, and they were more than 1°C greater than in June 1978 (Figure 7). The marked decrease in negative departures from normal and the unusual positive SST differences from last year north of 40°N were primarily due to the north-westward shift of the high pressure center and a more westerly position of the Aleutian low. From 40°N to 45°N, west of 135°W, westerly winds were below normal in strength and ocean mixing was also less than normal. Because of high winds, rough seas and adverse weather conditions along the U.S. west coast in June, albacore fishing within 300 miles of the coast was not good. However, tuna fishing between 300 and 800 miles off southern and central California was fair to good on several days in June. Rough ocean conditions considerably reduced albacore scouting efforts along the coast in June.

Western North Pacific

During June the Aleutian low pressure system was displaced westward from its normal position again as it was from January to April 1979. The western Pacific high pressure system was centered along 32°N, and surface pressures south of 40°N were 2 to 4 millibars above normal. Because of the strong high pressure ridge from the central Pacific to southern Japan and the westward displacement of the Aleutian low, surface wind mixing was above normal from 41°N to 45°N where SST's were more than 1°C below normal (Figure 6). The small band of above normal SST's from 36°N to 40°N were associated with the northern extension of the high pressure system. As a result of several large areas of negative departures north of 40°N, which have persisted most of this year, the north Pacific ocean front remained a pronounced feature in the western Pacific. This appears in Figure 4 where SST contours were closely spaced. The ocean front continued to be especially strong and divided into several separate frontal bands between the north coast of Japan and 150°E. This complex frontal structure apparently has been an important feature in prolonging the Japanese tuna fishery off northern Japan this year. The large area of negative SST departures from 25°N to 35°N east of 170°E was associated with stronger than normal easterly wind mixing along the southern boundary of the high pressure system.

Eastern Tropical Pacific

During June, SST's normally increase in the northern hemisphere with maximum increases of 1 to 2°C in the area between southern Baja California and the Revilla Gigedo Islands. Elsewhere north of the equator, SST's normally increase less than 1°C. Maximum cooling of 1 to 2°C normally takes place along the equator from 120°W to the coast of Ecuador and in the Peru Current to 20°S. Seasonal cooling usually occurs over the southern hemisphere as mid-winter approaches.

During June 1979 the SST pattern (Figure 8) was near normal over most of the eastern tropical Pacific. The largest SST departures occurred in areas where SST contours were closely packed off the coast of Baja California, along the equator and along the western edge of the Peru Current south of the equator. In these areas, negative SST departures adjacent to positive SST departures (Figure 9) were indicative of the formation of strong surface ocean fronts, especially southwest of the southern tip of Baja and just north of the equator east of 120°W (Figure 8).

South of Baja California the negative SST departures greater than 1°C were associated with the southward extension of the California Current which resulted partly from higher than normal northerly winds along the coast of southern California. In addition, tropical storm Andres formed near 10°N, 95°W on June 1 and moved northwest, crossing the coast of Mexico near Manzanillo on June 5. This storm and several other small tropical disturbances caused considerable ocean mixing and cooling of the surface layers along their paths of movement which were parallel to the south coast of Mexico. East and west of the tropical storm paths, SST's were greater than 29°C (Figure 8) and above normal for June. Another tropical storm (Blanca) formed over warm water on June 22 near 10°N, 110°W and moved westward for several days but dissipated north of the tropical tuna fishing grounds between 120°W and 130°W. During June, skipjack tuna fishing was good along the southwest coast of Baja and in the Revilla Gigedo Islands. East of 110°W and north of the equator, tuna fishing was frequently interrupted by bad weather in areas where SST's were colder than normal. There were diminishing signs of fish in areas of very warm water (greater than 29°C) during June.

Along the equator from 3°N to 5°S between 83°W and 140°W, the southeast trade wind speeds were above normal, and they aided equatorial upwelling in areas where SST's were more than 1°C below normal (Figure 9). The large area north of the equator between 100°W and 115°W with SST's more than 1°C above normal developed in May and persisted in June where the equatorial front was closer to the equator than usual. However, surface winds were also above normal in this equatorial area.

Along the coast of Peru, south of 5°S, SST's were more than 1°C below normal except from 9°S to 13°S where a tongue of warm water has persisted between the coastal and offshore branches of the Peru Current for several months. The subtropical high pressure system in the southern hemisphere (normally centered near 30°S, 90°W) has been above normal in strength since March 1979. As a result, surface winds have been steady and strong. This has aided in keeping coastal upwelling strong and ocean mixing greater in the past 3 months than during the previous 36 months. Peruvian fishermen have been recently reporting large incidental catches of anchovy,

an improvement over last year. Off the west coast of Colombia and northern Ecuador, skipjack tuna fishing was good in June. Apparently, increased upwelling and biological production in the Peru current has been providing a more plentiful supply of food for the various South American coastal fisheries this year.

JUNE 1961-1979

FIG. 1—OBSERVED MEAN VALUES

—0000—BAROMETRIC PRESSURE

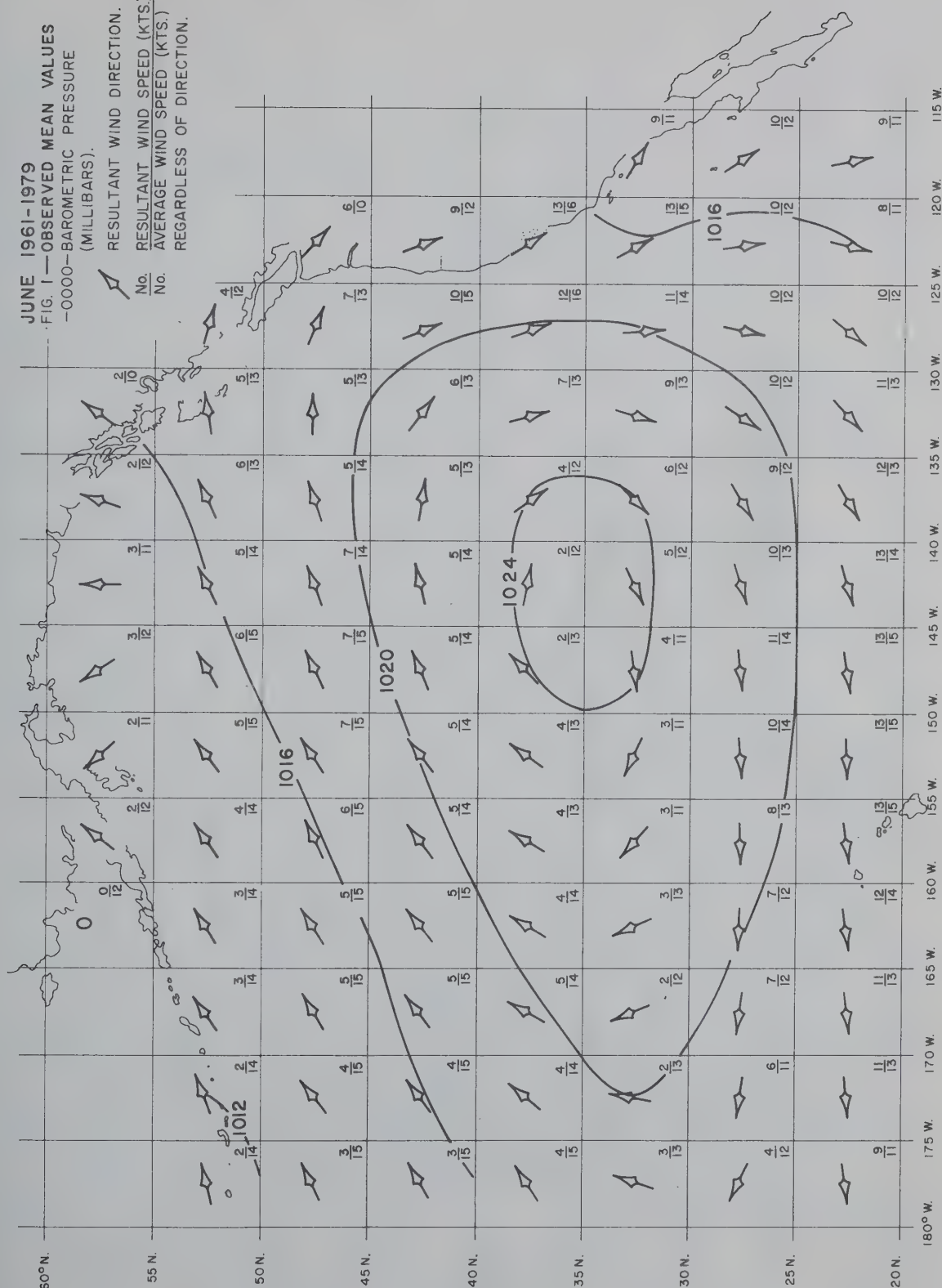
(MILLIBARS).

RESULTANT WIND DIRECTION.

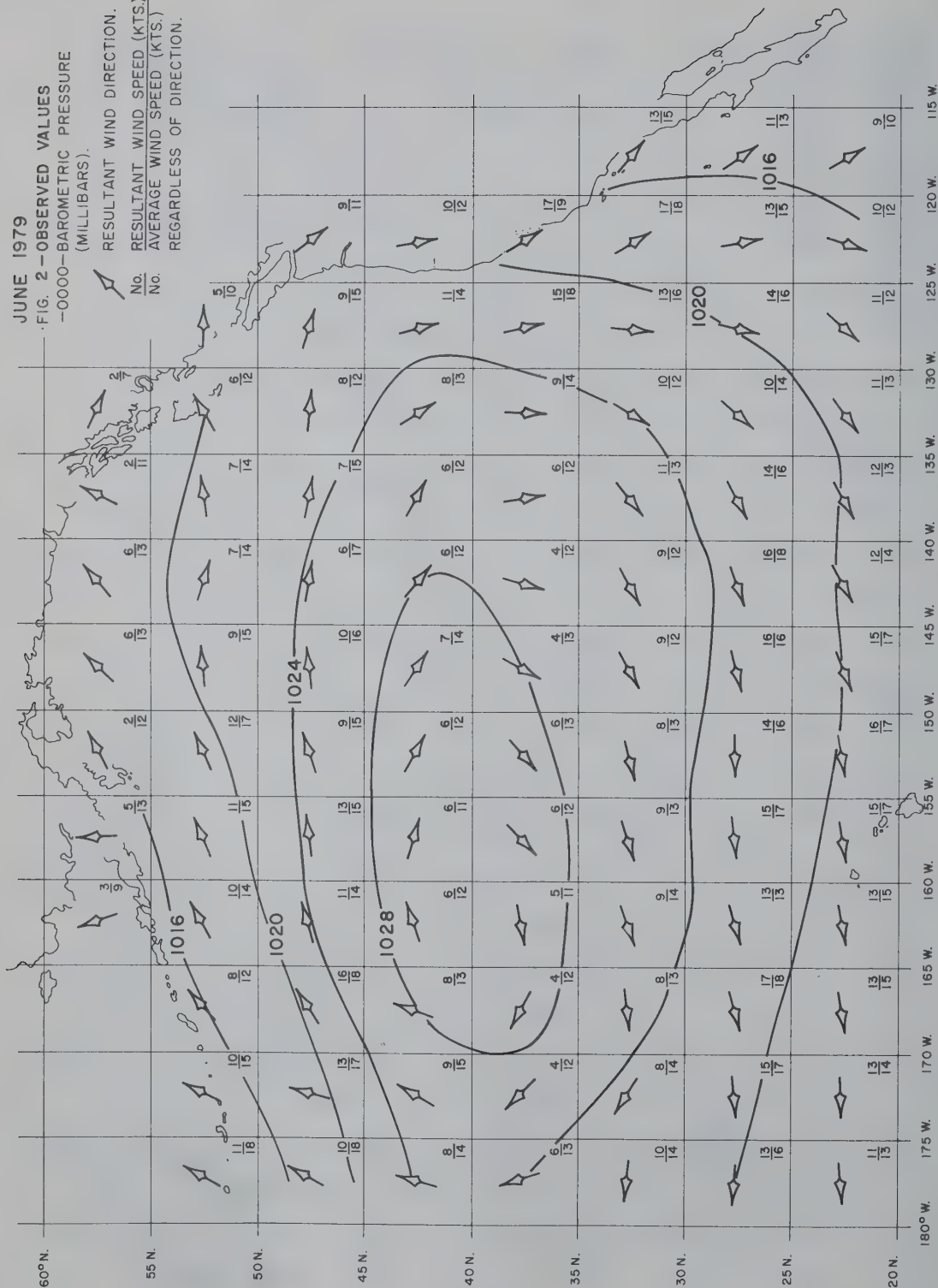
No. RESULTANT WIND SPEED (KTS.)

No. AVERAGE WIND SPEED (KTS.)

REGARDLESS OF DIRECTION.

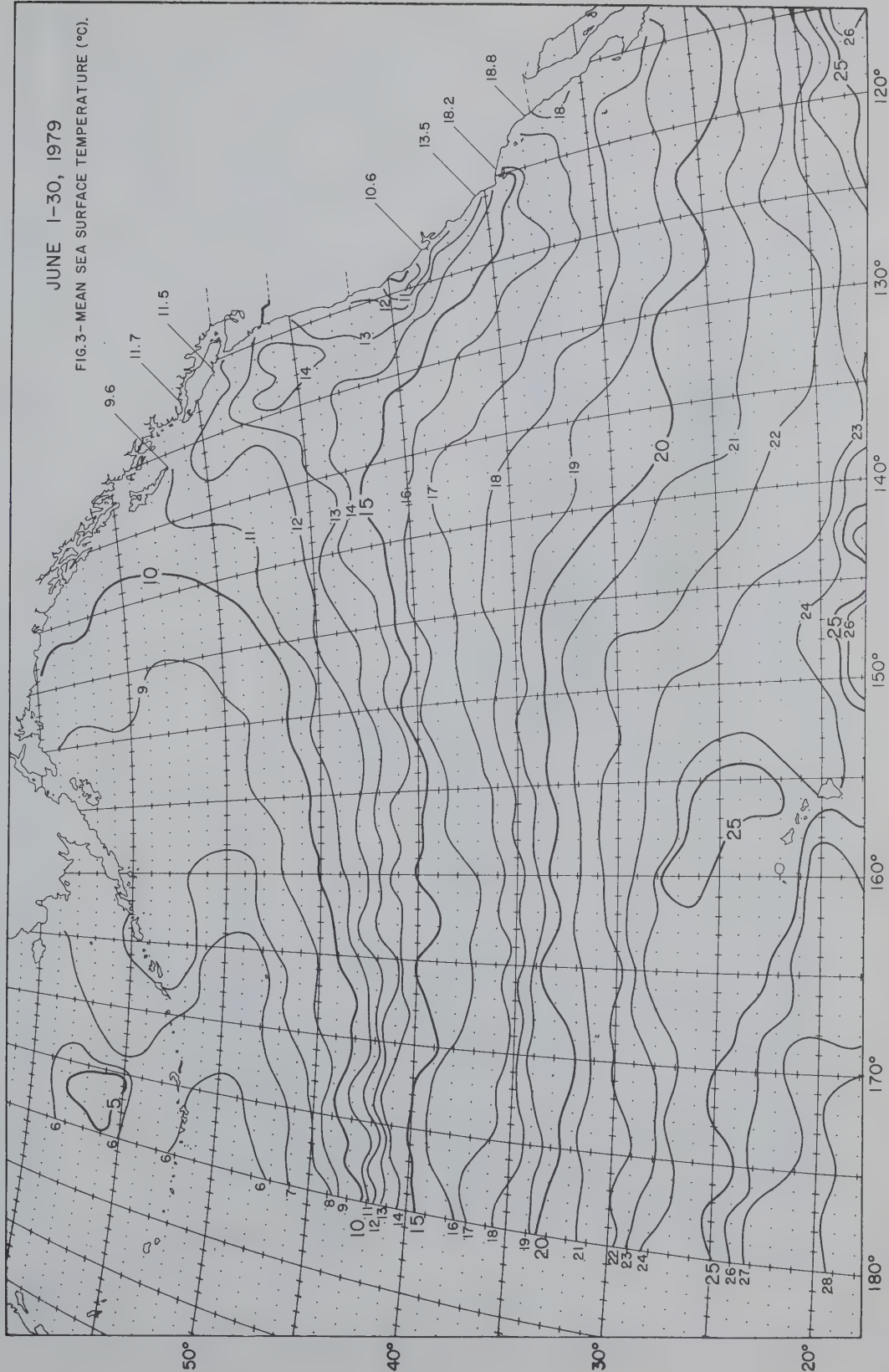


JUNE 1979
 FIG. 2 - OBSERVED VALUES
 -0000-BAROMETRIC PRESSURE
 (MILLIBARS).
 RESULTANT WIND DIRECTION.
 RESULTANT WIND SPEED (KTS.)
 AVERAGE WIND SPEED (KTS.)
 REGARDLESS OF DIRECTION.



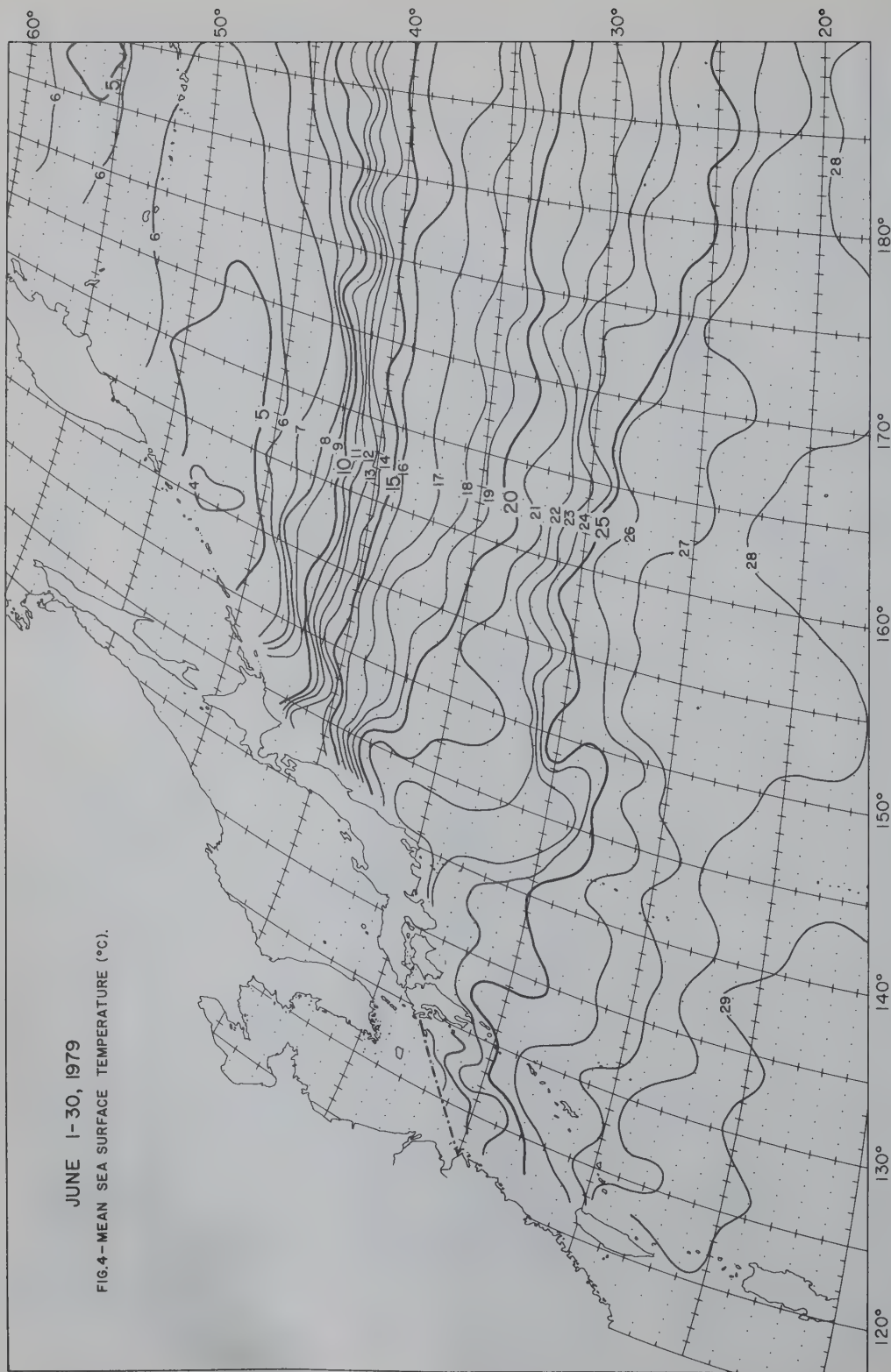
JUNE 1-30, 1979

FIG. 3-MEAN SEA SURFACE TEMPERATURE (°C).



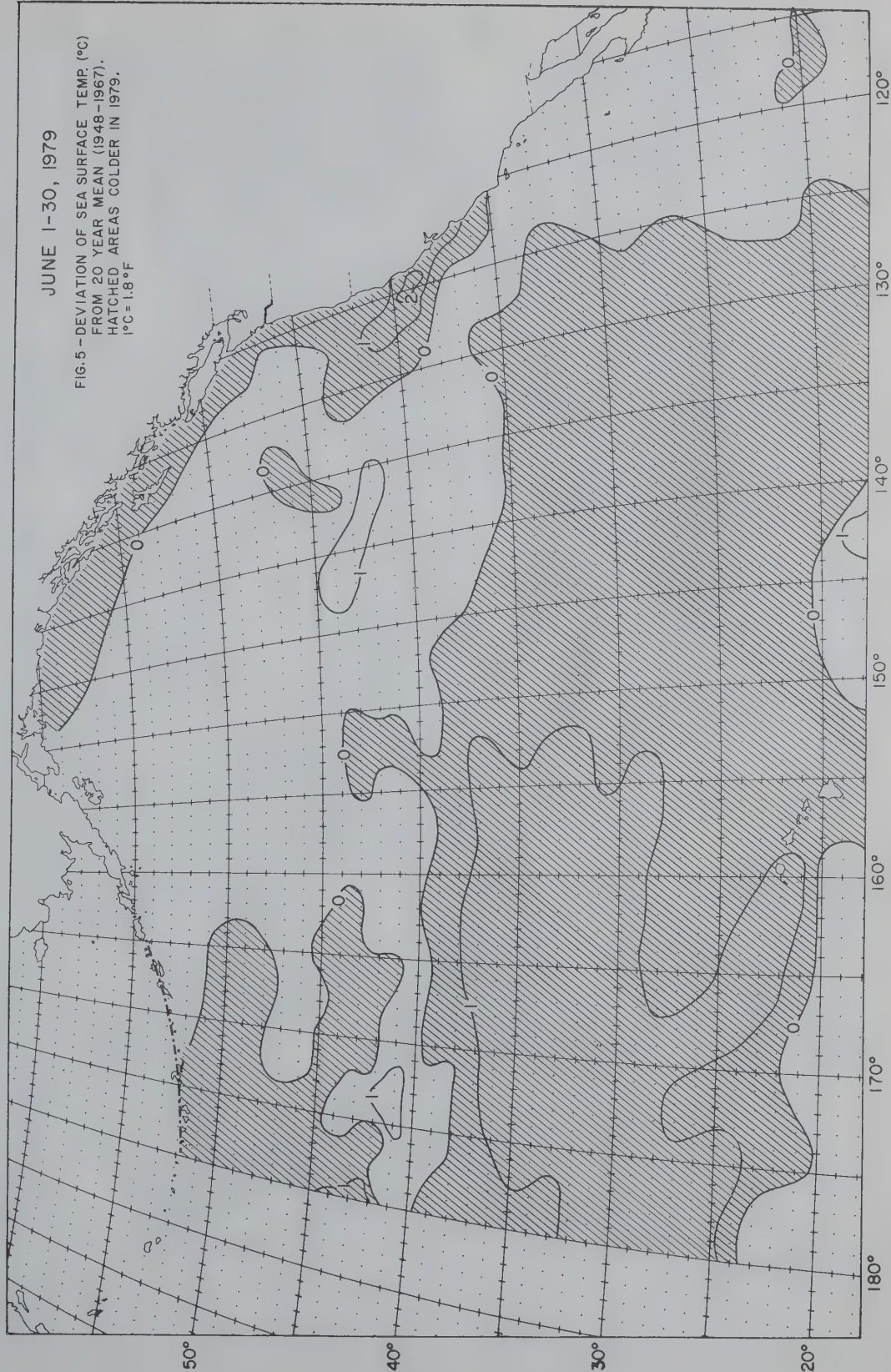
JUNE 1-30, 1979

FIG.4-MEAN SEA SURFACE TEMPERATURE (°C).



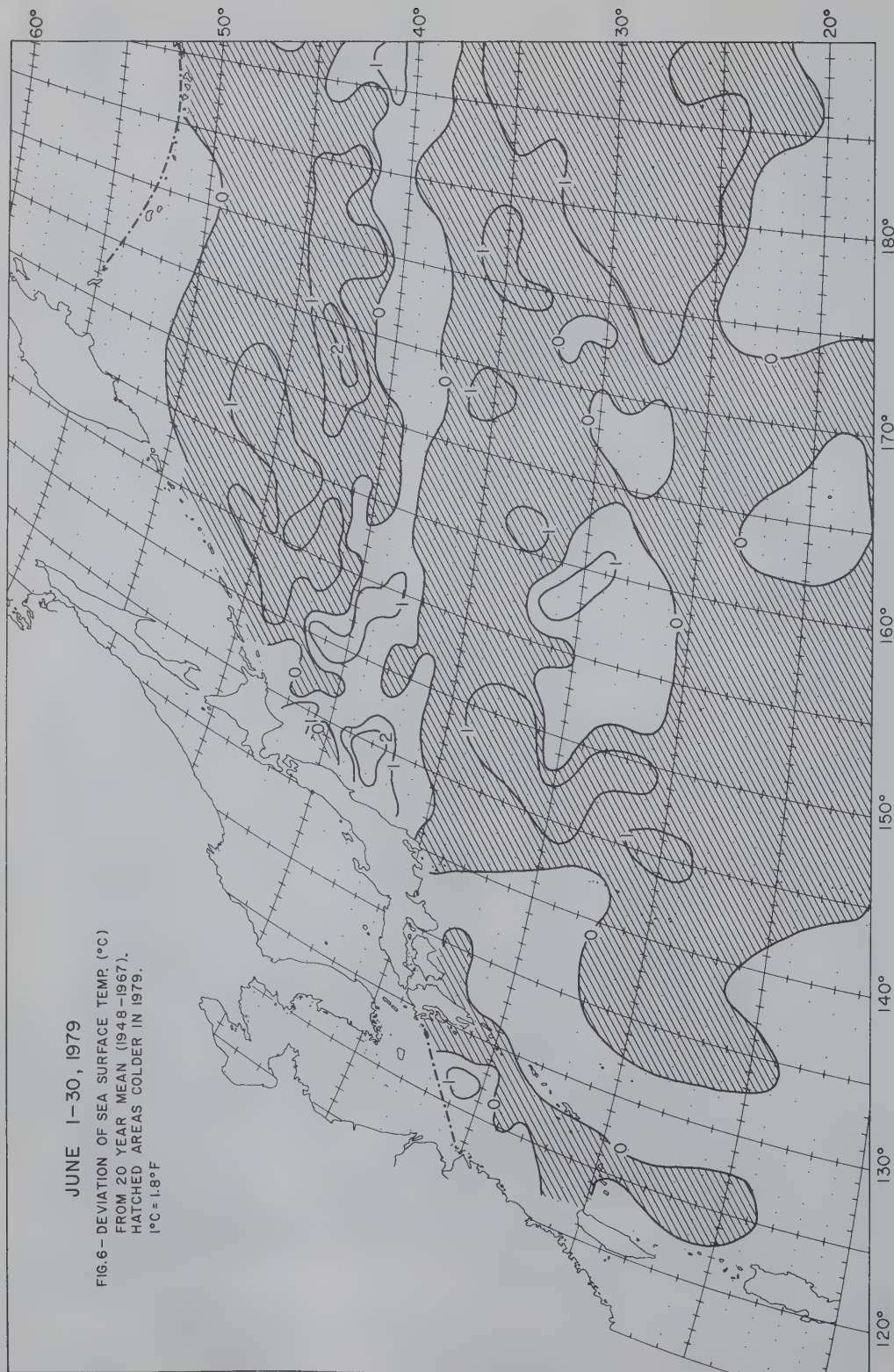
JUNE 1-30, 1979

FIG. 5 - DEVIATION OF SEA SURFACE TEMP. (°C)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1979.
1°C = 1.8°F



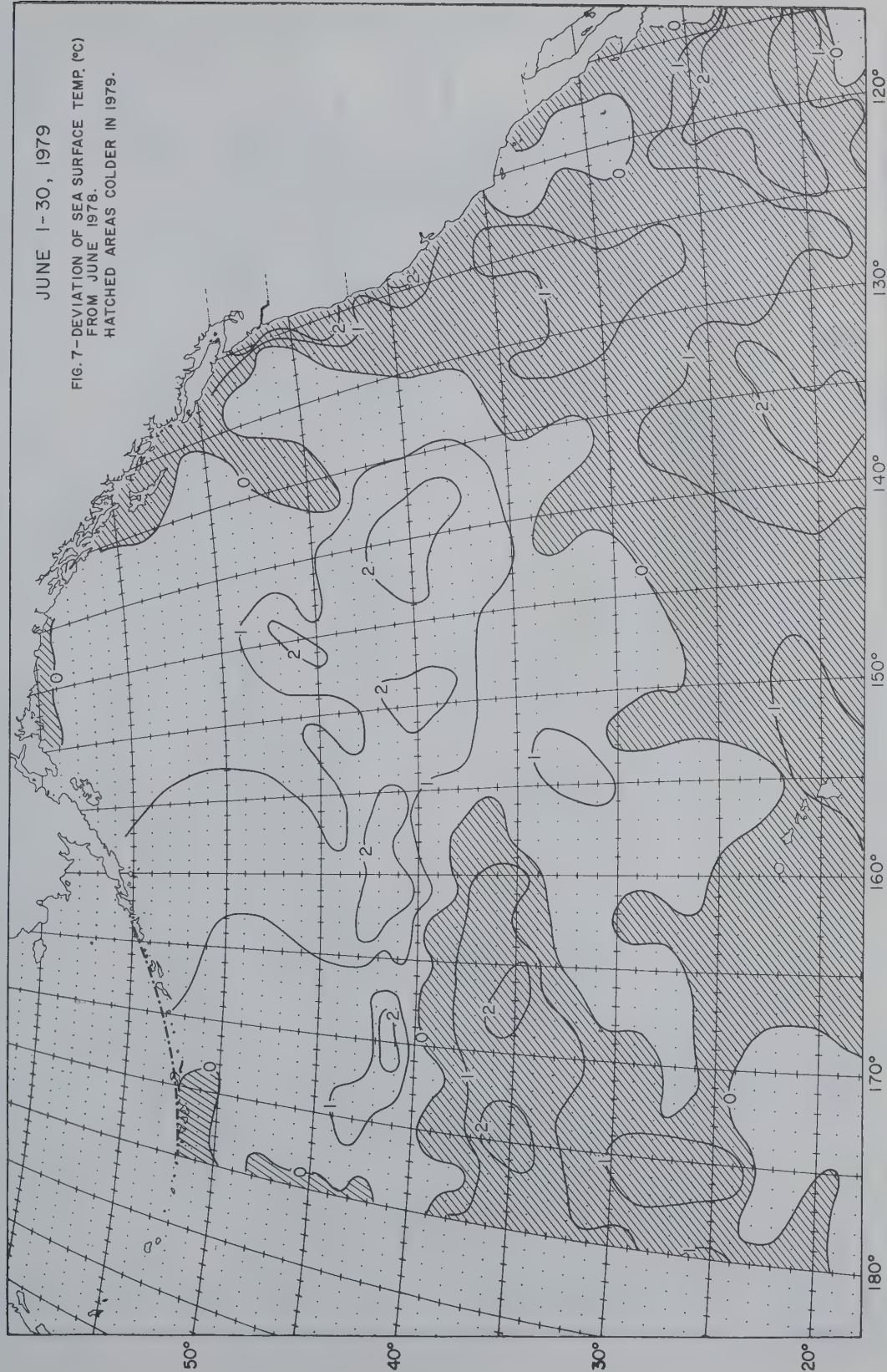
JUNE 1-30, 1979

FIG. 6- DEVIATION OF SEA SURFACE TEMP. ($^{\circ}\text{C}$)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1979.
 $1^{\circ}\text{C} = 1.8^{\circ}\text{F}$



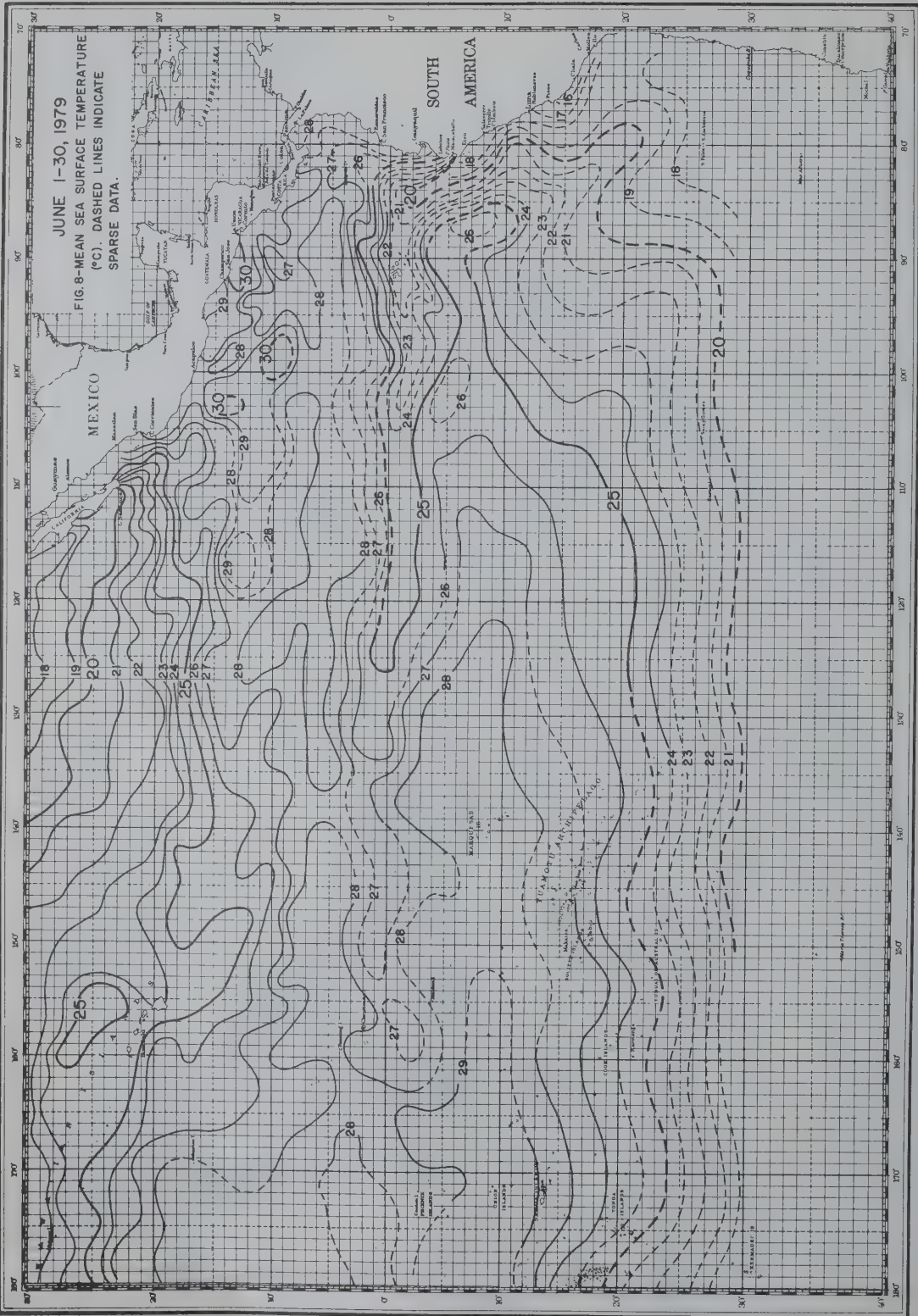
JUNE 1-30, 1979

FIG. 7-DEVIATION OF SEA SURFACE TEMP. (°C)
FROM JUNE 1978.
HATCHED AREAS COLDER IN 1979.



JUNE 1-30, 1979

FIG. 8-MEAN SEA SURFACE TEMPERATURE
(°C). DASHED LINES INDICATE
SPARSE DATA.



JUNE 1-30, 1979

FIG.9-DEVIATION OF SEA SURFACE TEMP. (°C)
FROM 20 YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1979.

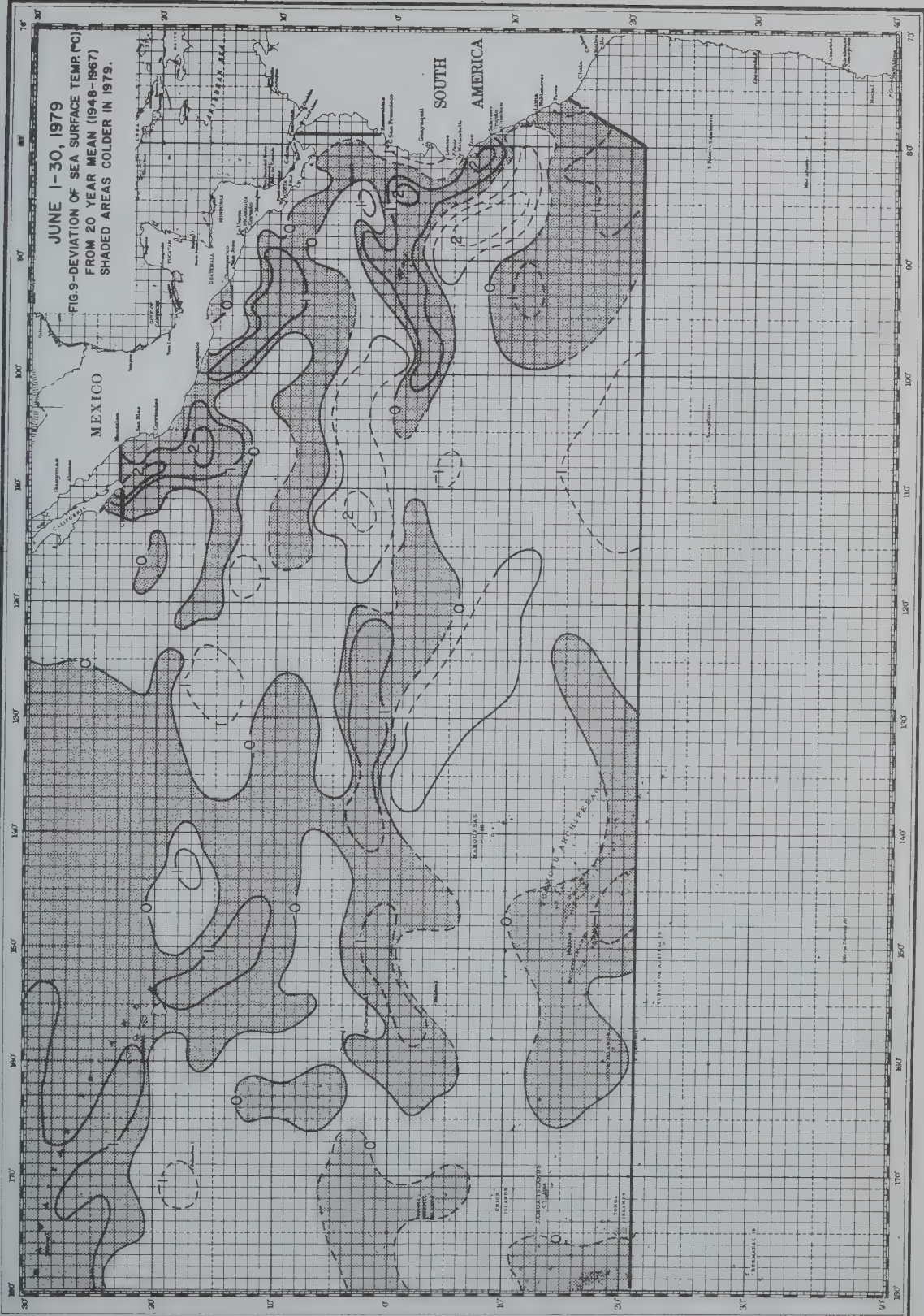
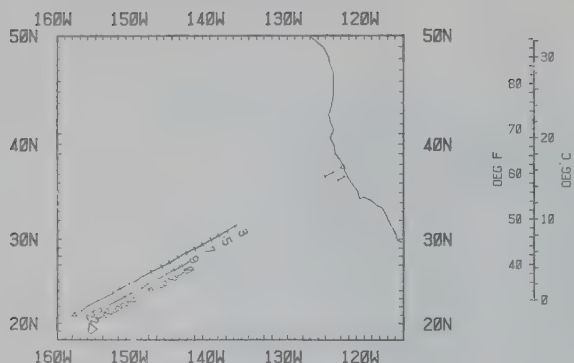
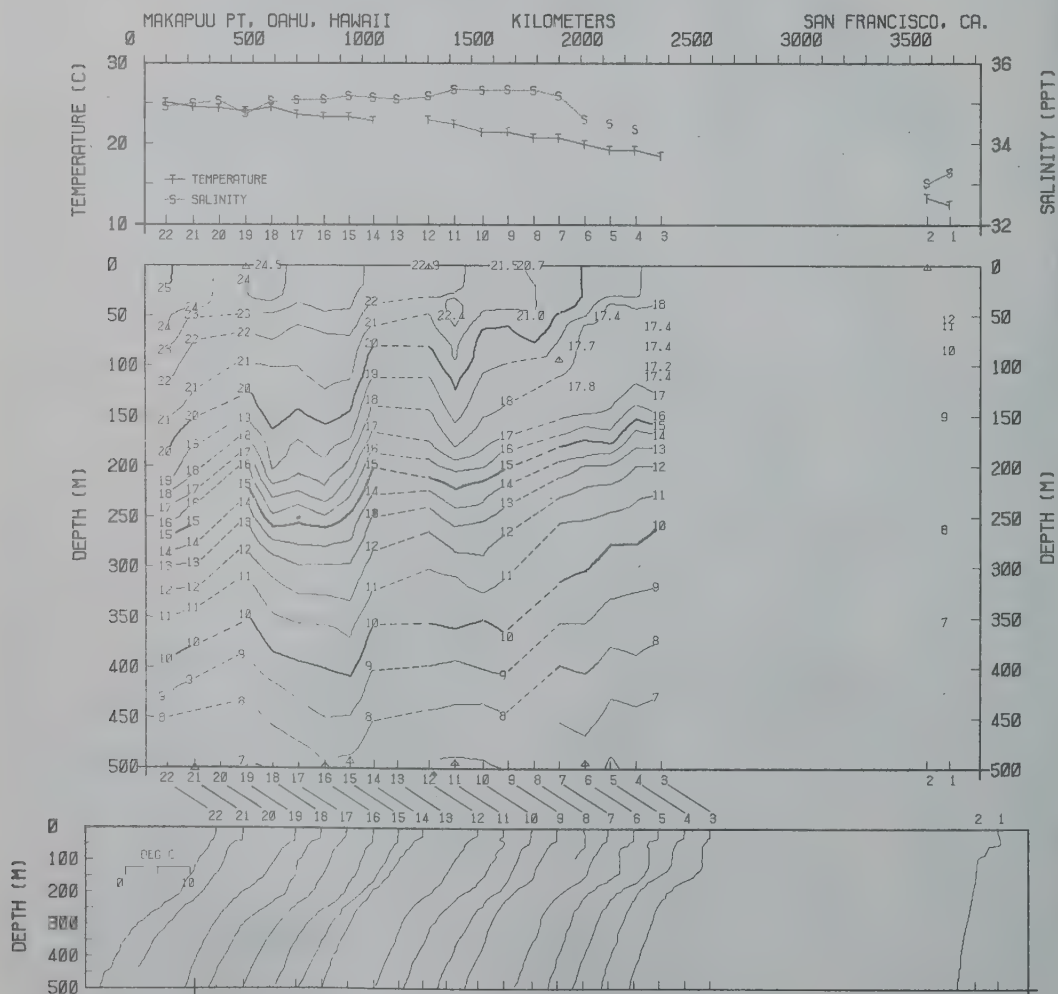


FIGURE 10

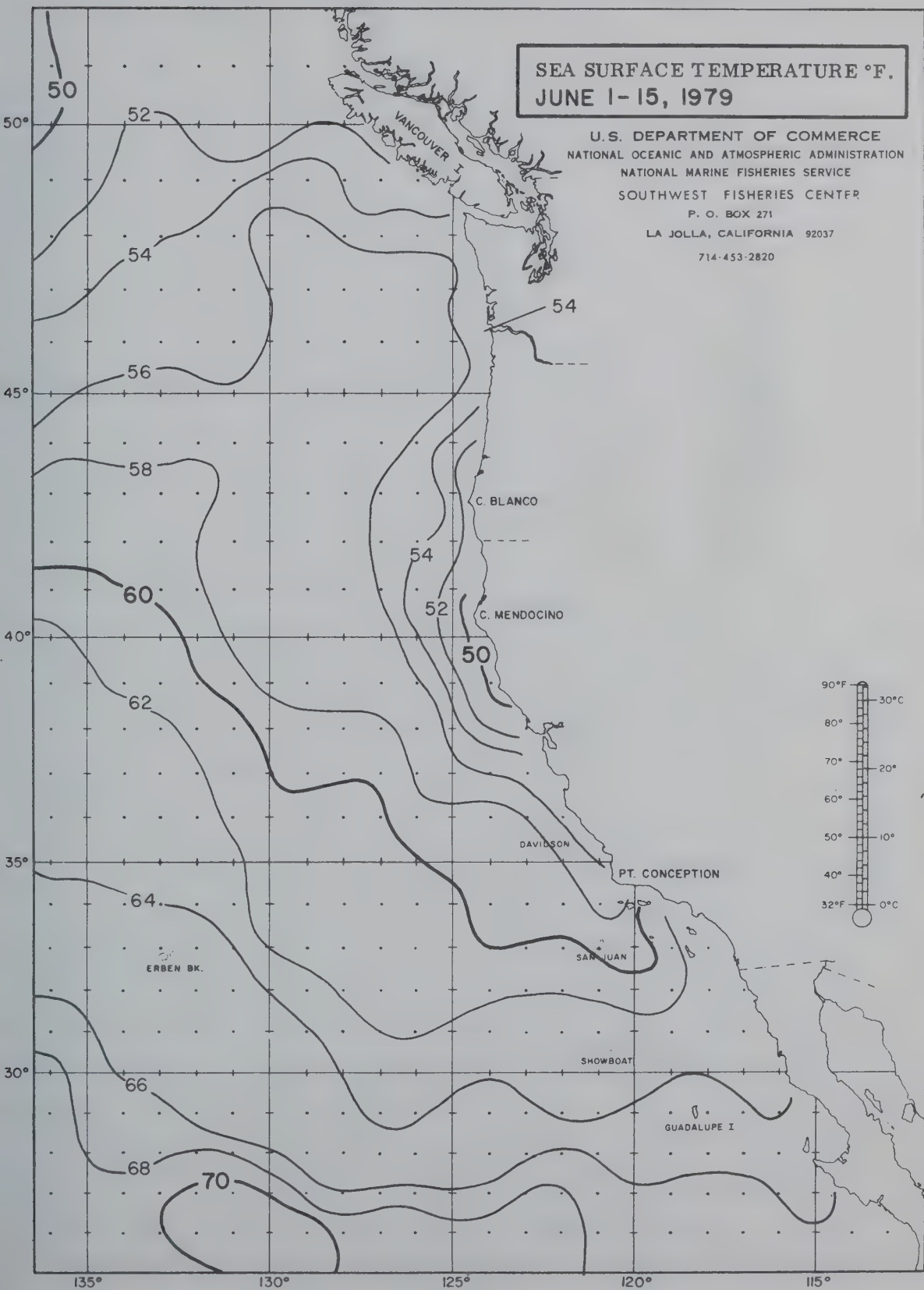


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FISHING INFORMATION - supplement



FISHING INFORMATION - supplement

SEA SURFACE TEMPERATURE °F.
JUNE 16 - 30, 1979

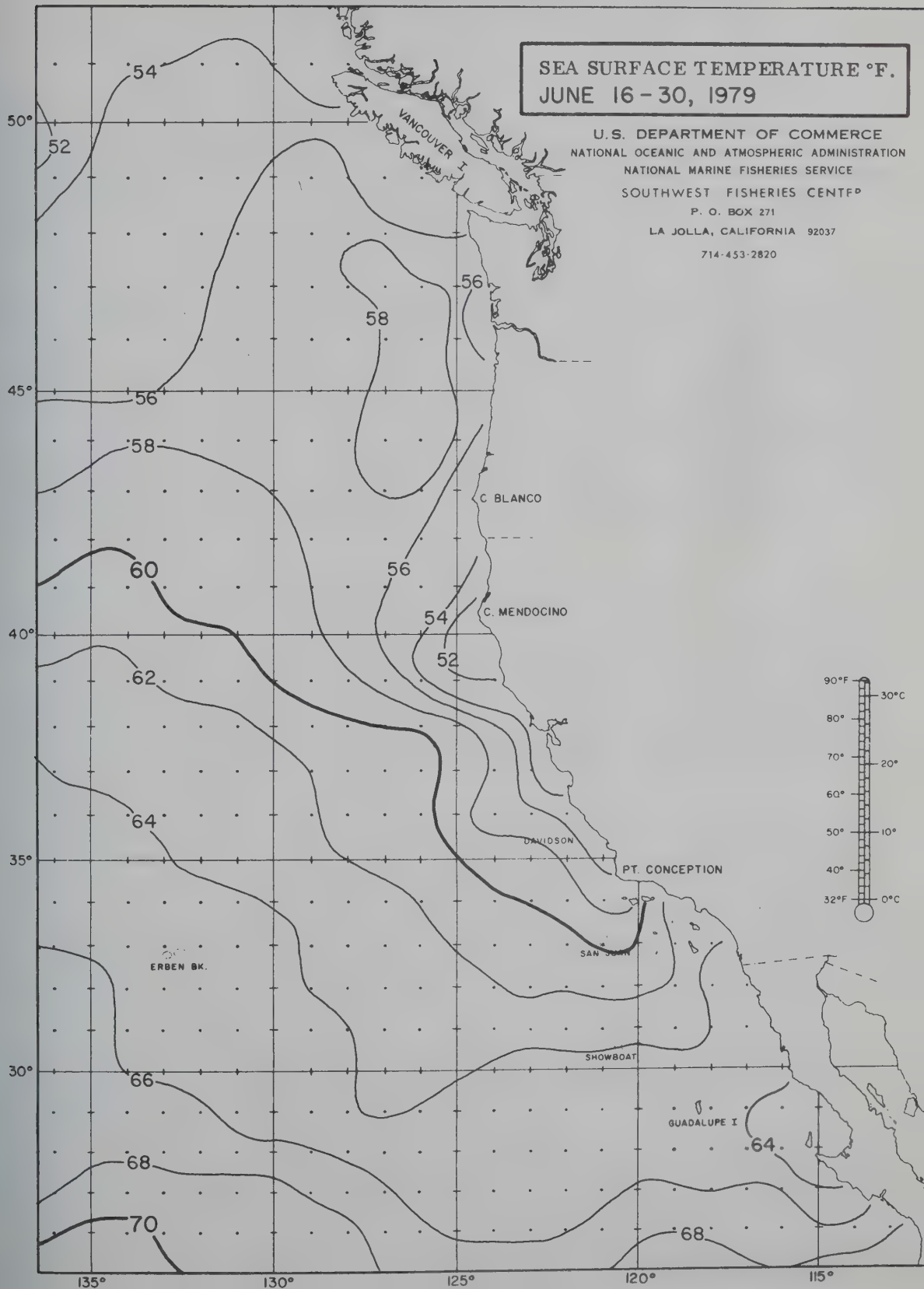
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NATIONAL MARINE FISHERIES SERVICE

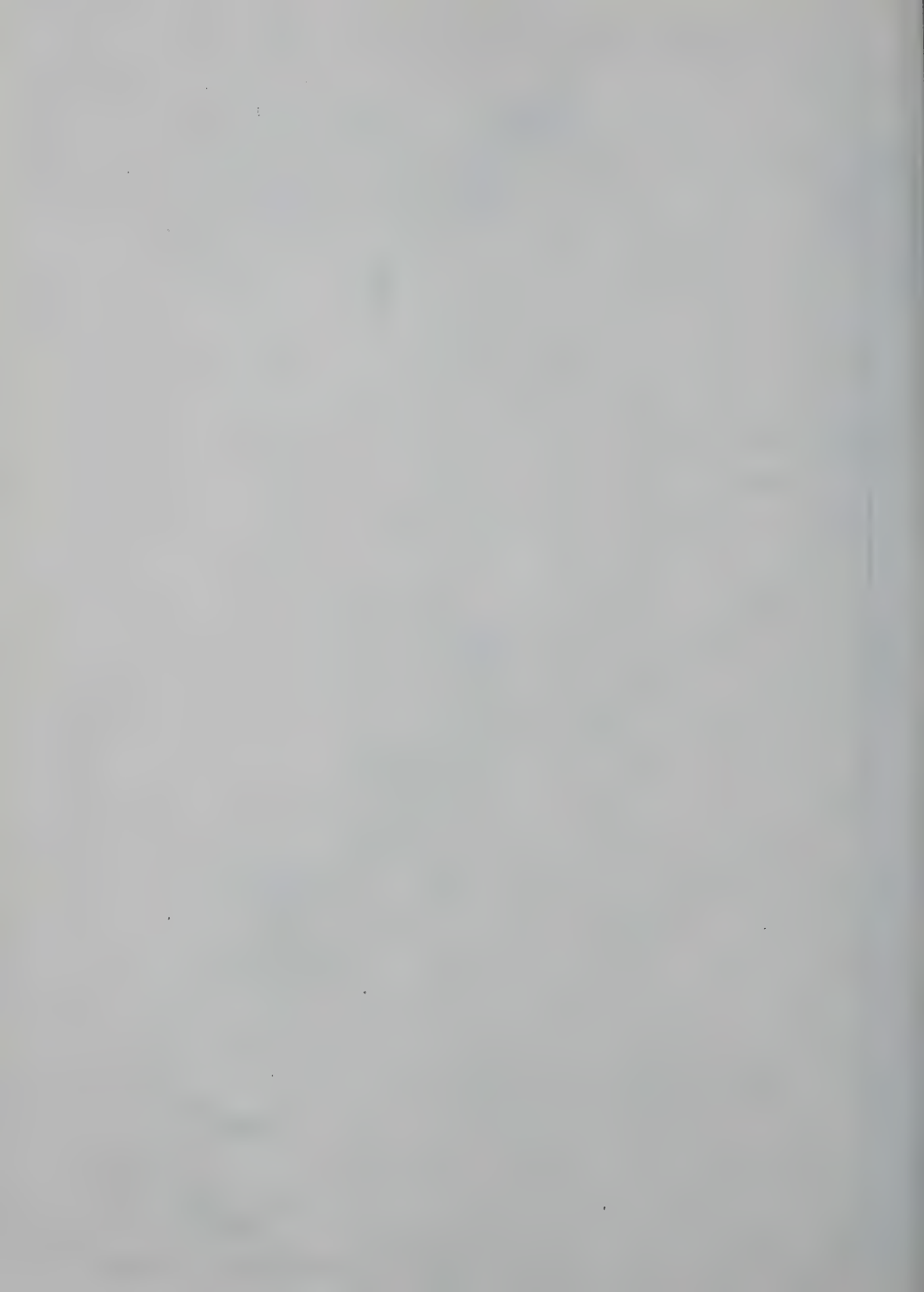
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NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92038

BULLETIN NO. 79-1

1979 ALBACORE FORECAST

We expect the main groups of albacore to be late in arriving in waters along most of the Pacific west coast 1979. Off the coast of California, we believe this is because during the 1978-79 winter apparently few fish of the "southern" group of albacore remained in the vicinity of Baja California, and that the major part of the "northern" group migrated further west into central Pacific waters than they have done for the past several years. Lack of any substantial catches of albacore from off Baja California during the 1978 fishing season after about September indicates that fish were not available in this area. Scouting by a small number of jig vessels that departed San Diego in late May has yielded no or small catches in southern waters out to about Erben Bank. As of the end of the second week in June, the best daily catch has been 65 fish taken near 33°N, 137°W.

We anticipate a late arrival of the "northern" group of albacore that enter the U.S. fishery off the Pacific west coast and that the majority of the fish which will move into these waters will probably not arrive there until mid-August. Results from albacore research studies in recent years indicate that the group of fish which enter the U.S. fishery off the Pacific Northwest is separate from the group that enters the fishery south of about San Francisco and that the two groups of fish follow different migratory patterns. The "northern" group makes trans-Pacific migrations between the eastern North Pacific and the western North Pacific where they are also caught in Japanese albacore fisheries. The Japanese livebait fishery for albacore in the western Pacific was late in starting and slow in developing this year, apparently in response to variations in oceanographic conditions in the eastern Pacific. Also, albacore jigboats that left the U.S. in March to fish waters in the vicinity of Midway Island made no catches of substance between the U.S. and the dateline until the third week in May when days of very good fishing were reported interspersed with days of poor catch. This evidence suggests that at least part of the "northern" group of albacore was late in leaving the western Pacific this year for their migration to waters off the Pacific Northwest. It is not possible to predict how much of the "northern" group will arrive in the eastern Pacific to be available to the U.S. fishery; however, there is a good possibility that a large portion of the fish will not have time to make the migration before ocean waters in the Pacific Northwest cool below the optimal temperature preference for albacore.

As a result of the expected timing of migration, oceanographic conditions, and seasonal development of the fishery, we expect that about 60% of the commercial albacore catch this year will be made in waters south of San Francisco and about 40% of the landings from waters north of San Francisco.

During the 1978-79 winter, sea surface temperatures within about a 200-250 mile band adjacent to the shore were as much as 2°-4°F cooler than normal along the entire coast between British Columbia and Baja California. However, by the end of March, the cold water anomaly along the coast had eroded and surface temperatures returned toward normal. In waters beyond about 300 miles off the coast, surface temperatures were generally about 2°F warmer than normal during winter months. By the end of March, the offshore warm water anomaly reached shoreward to about 130°W, north of 45°N, and at the end of May extended to within about 100 miles of the coast off the California River and in to the coast off the northern part of Vancouver Island. A warm water anomaly up to 2°F above normal also developed during the last half of May off Baja California extending north to about the San Juan Seamount. Surface temperatures at the end of May off the remainder of the coast from the Channel Islands to the Pacific west were about normal.

If the warmer-than-normal waters off the coast of northern Washington and British Columbia persist, fish may move quickly into these areas soon after arriving in the Pacific Northwest. Upwelling along most of the west coast of the U.S. was about normal during the winter of 1978-79 and these conditions have persisted through the spring months. This indicates that about average feeding conditions should prevail for albacore throughout the season.

The NMFS La Jolla Laboratory will issue albacore advisory information throughout the 1979 season. The advisory information will include sea surface temperature charts, narrative albacore fish bulletins, and daily broadcasts of albacore fishing information over marine and commercial radio bands. The broadcasts will be made twice daily on weekdays and once on Saturday mornings from July 16 through October 31, or until the albacore season ends. Nearly nationwide reception of the albacore fishery advisory broadcasts will be available again this year. The schedule of frequencies for the broadcasts are as follows:

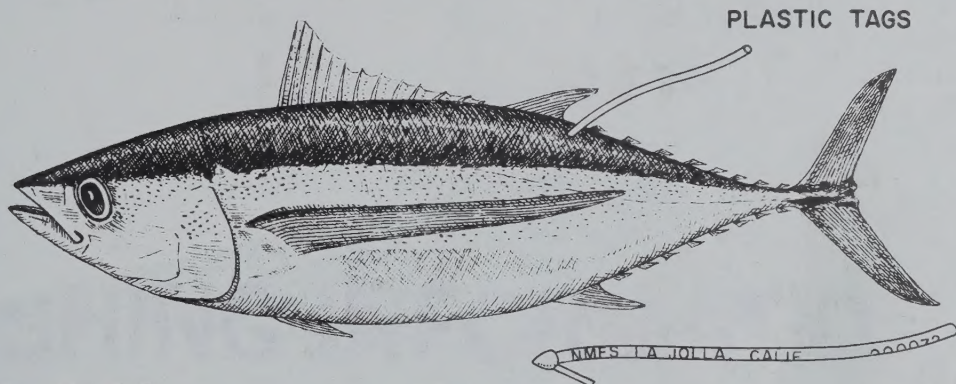
WWD (La Jolla, CA) on SSB carrier frequencies 4431.8, 8644.1, and 17408.6 kHz at 0645 and 1745 PDT on weekdays and 0815 PDT on Saturdays.
NMC (Point Reyes Coast Guard) on SSB carrier frequency 8760.8 at 0645 and 1945 PDT.
KRED (Eureka, CA) on commercial AM 1480 kHz. Schedule to be given later.
KBBR (North Bend, OR) on commercial AM 1340 kHz at 0605 and 1805 PDT.
KNPT (Newport, OR) on commercial AM 1310 kHz at 0615 and 1830 PDT.
KAST (Astoria, OR) on commercial AM 1370 kHz at 0610 and 1805 PDT.

To determine the upper sideband assigned frequencies for tunable receivers, add 1.4 kHz to WWD and NMC carrier frequencies. NMFS will also transmit weekly charts of sea surface temperature via radio facsimile over radio on WWD on Fridays, at 11:00 PDT on 8644.1 kHz beginning June 29.

Staff, Albacore Fisheries Program
R. Michael Laurs, Leader

\$ REWARD \$

FOR ALBACORE TUNA TAGS



PLASTIC TAGS

YELLOW TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY \$ 2.00 FOR EACH YELLOW TAG RECOVERED. (NO NEED TO RETURN FISH)

RECORD:

- ▶ WHERE
 - ▶ WHEN
 - ▶ HOW
 - ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)
- } *FISH WAS CAUGHT*

FORWARD TO NMFS ADDRESS ON TAG

RED TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY \$ 50.00 FOR EACH RED TAG & FISH RETURNED. (FISH WITH TAG INTACT MUST BE RETURNED)

RECORD:

- ▶ WHERE
 - ▶ WHEN
 - ▶ HOW
 - ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)
- } *FISH WAS CAUGHT*

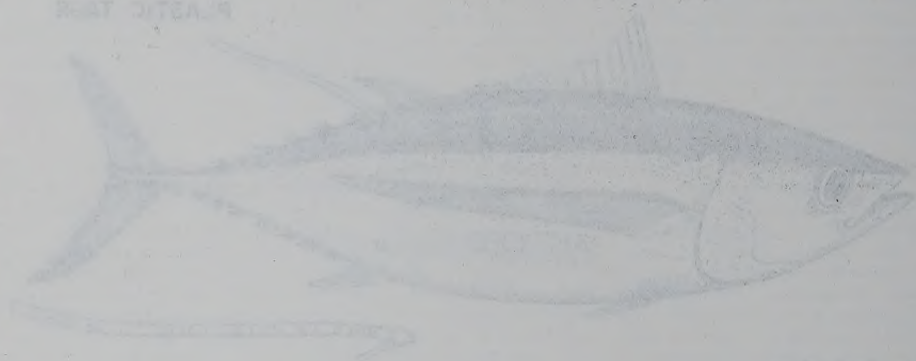
NOTIFY NMFS P.O. BOX 271, LA JOLLA, CA. TEL. (714) 453-2820

THE AMERICAN FISHERMEN'S RESEARCH FOUNDATION WILL AWARD CASH PRIZES FOR YELLOW & RED TAG NUMBERS DRAWN IN AN ANNUAL LOTTERY.

\$ REWARD \$

FOR ALBACORE TUNA TAGS

PLASTIC TAG



YELLOW TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY \$ 500 FOR EACH
YELLOW TAG RECOVERED. (NO NEED TO RETURN FISH)

RECORD:

WHERE
WHEN
HOW

FISH WAS CAUGHT

LENGTH OF FISH (TIP OF LOWER JAW
TO FORK OF TAIL)

FORWARD TO NMFS ADDRESS ON TAG

RED TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY \$ 5000 FOR EACH
RED TAG & FISH RETURNED. (FISH WITH TAG INTACT MUST BE RETURNED)

RECORD:

WHERE
WHEN
HOW

FISH WAS CAUGHT

LENGTH OF FISH (TIP OF LOWER JAW
TO FORK OF TAIL)

NOTIFY NMFS, P.O. BOX 271, LA JOLLA, CA. TEL. (714) 453-2520

THE AMERICAN FISHERMEN'S RESEARCH FOUNDATION WILL AWARD
CASH PRIZES FOR YELLOW & RED TAG NUMBERS DRAWN IN AN
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